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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants :	Cox et al.	Customer No. :	21003
Serial No. :	10/773,663	Examiner :	Not Yet Assigned
Filed :	February 6, 2004	Group Art Unit:	1732

For : METHOD OF FORMING A DECORATIVE STRUCTURE AND A DECORATIVE STRUCTURE MADE BY THE METHOD

SUBMISSION OF PRIORITY DOCUMENT

I hereby certify that this paper is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450

June 4, 2004
Date of Deposit

Rochelle K. Seide
Attorney Name

32,300
PTO Registration No.

Rochelle K. Seide
Signature

June 4, 2004
Date of Signature

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

A claim for priority under the provisions of 35 U.S.C. §119 for the above-identified U.S. patent application based upon Great Britain Patent Application No. 0302755.4, filed February 7, 2003, was made in the Patent Application Transmittal dated February 6, 2004, and is hereby again made. A certified copy of the Great Britain priority document is enclosed herewith.

There should be no fee required for this submission. However, if any fee is required, or if any overpayment has been made, the Commissioner is hereby authorized to charge any fees, or credit or any overpayments made, to Deposit Account 02-4377. A duplicate copy of this paper is enclosed.

Respectfully submitted,

Rochelle K. Seide

Rochelle K. Seide
Patent Office Reg. No. 32,300

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New York, NY 10112

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(212) 408-2626

Enclosures

The Patent Office
Concept House
Cardiff Road
Newport
South Wales
NP10 8QQ

I, the undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) of the Deregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of the Comptroller-General, hereby certify that annexed hereto is a true copy of the documents as originally filed in connection with the patent application identified therein.

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Signed

Dated 3 February 2004

Patents Form 1/77

Patents Act 1977
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07FEB03 E783070-1 C04150
P01/7700 0.00-0302755.4

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(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

The Patent Office

Cardiff Road
Newport
South Wales
NP10 8QQ

1. Your reference 563

2. Patent application number *(The Patent Office will fill in this part)* 0302755.4 07 FEB 2003

3. Full name, address and postcode of the or of each applicant *(underline all surnames)*

7911357001

Patents ADP number *(if you know it)*

If the applicant is a corporate body, give the country/state of its incorporation

CREATIVE RESINS INTERNATIONAL LTD.
UNIT 2/3, CHURCH ROAD BUSINESS CENTRE
CHURCH ROAD,
MURSTON
SITTINGBOURNE,
KENT, ME10 3RS
GB

4. Title of the invention

DECORATIVE GLASS

5. Name of your agent *(if you have one)*

"Address for service" in the United Kingdom to which all correspondence should be sent *(including the postcode)*

COHEN, ALAN NICOL
2 GROVE PLACE
TATSFIELD
Nr. WESTERHAM
KENT
TN16 2BB

Patents ADP number *(if you know it)* 6963557001

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and *(if you know it)* the or each application number

Country	Priority application number *(if you know it)*	Date of filing *(day / month / year)*

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application	Date of filing *(day / month / year)*

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? *(Answer 'Yes' if:*

a) any applicant named in part 3 is not an inventor, or

b) there is an inventor who is not named as an applicant, or

c) any named applicant is a corporate body.

See note (d))

YES

Patents Form 1/77

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Continuation sheets of this form	
Description	4
Claim(s)	2
Abstract	1
Drawing(s)	1

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Statement of inventorship and right to grant of a patent *(Patents Form 7/77)*	
Request for preliminary examination and search *(Patents Form 9/77)*	
Request for substantive examination *(Patents Form 10/77)*	
Any other documents *(please specify)*	

11. I/We request the grant of a patent on the basis of this application.

Signature A. N. Cohen Date 08/02/03

12. Name and daytime telephone number of person to contact in the United Kingdom A. N. Cohen 01959 577172

Warning

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Decorative Glass

The present invention relates to a decorative glass structures such as windows, panels, mirrors etc. which have the appearance of textured glass or deeply contoured glass and to methods of forming such structures.

In order to obtain brilliant cut or bevelled glass a process is used in which CNC machines use diamond tipped heads cooled with water to cut grooves and curved shapes into a plastic or glass surface. Light diffracts through the transparent outline in a similar way to brilliant cut or bevelled glass. This process requires expensive equipment and is difficult and expensive to carry out for complex patterns and for a large number of panels.

US Patent 5783264 describes a decorative window which consists of a thick transparent plastic resin layer laminated to a sheet of glass. The resin layer can be decorative and can have a finely detailed textured surface. The Patent also describes a method of forming such a structure by forming a silicone mould, made from a Rubber Silicon from a master and placing this mould on a sheet of glass which has been coated with an adherent layer, filling this mould with resin and allowing the resin to set and removing the mould. The resins disclosed are polyester resins containing an organosilane ester.

The adherent layer disclosed is formed of an organosilane and the resin disclosed is a polyester resin which is mixed with a small amount of a peroxide catalyst and an organosilane ester so that after the mould has been filled with the resin, the resin hardens to form a structure; the mould is then removed.

However the presence of the organosilane ester and in particular the use of a Rubber Silicon mould adversely affects the curing of the surface of the polyester resin leaving it sticky to the touch. This means that extreme care needs to be taken once the silicon mould has been removed as the sticky surface is easily contaminated with dust, debris and finger marks which cannot be removed without showing evidence.

In addition the use of Silicon Rubber moulds requires direct heating of the resin to bring about an effective cure. The resin can react with the mould to cause styrenisation of the mould so that the mould has to be thoroughly cleaned, washed and dried after a number of castings. Rubber Silicon moulds eventually lose their flexibility and hairline cracks appear which render the mould useless.

We have now devised an improved system which overcomes these problems.

According to the invention there is provided a method of forming a decorative glass structure which comprises positioning a mould against a flat sheet to form a mould cavity between the sheet and the mould surface, introducing a curable resin into the mould cavity to form a resin sheet with a contoured surface, curing the resin, and releasing the mould to form a sheet having a contoured resin sheet adhered to one surface in which method the mould has a substantially inelastic surface.

The mould surface may be comprised of any substantially inelastic material and preferably the mould is made of a substantially inelastic material.

The sheet is preferably a glass sheet, but it can be a rigid resin or plastic sheet or something similar. Preferably the sheet is transparent or translucent but it can be coloured, silvered etc.

Preferably there is a release agent such as gel, oil or wax, or chemical release agent on the surface of the mould so that the mould is readily releasable from the cured resin.

Preferably around the mould is a groove into which a sealing strip e.g. made of silicone rubber, is located and the glass sheet is positioned on the strip so that the height of the strip above the mould controls the thickness of the resin layer on the glass surface.

The substantially inelastic material forming the mould surface may be reinforced by a material to form a rigid structure. If required the surface of the mould can be patterned so that surface effects can be formed on the casting.

The casting resin is preferably a resin which, when it cures, forms a hard transparent glass like surface such as a polyester e.g. an acrylate or polyacrylate which is introduced into the mould cavity with a hardener so that it cures to form a hard resin. As the mould is not made of silicone, such as a Rubber Silicon, there is no impaired surface cure on the casting resin; in the absence of the silicon mould, curing of the resin takes place completely at ambient temperature and without the necessity of direct heating. The surface of the cast resin structure is fully cured and hard and dry to touch. This allows it to be used in a single glazed environment such as mirrors, kitchen doors or shower screens. It can be encapsulated within an insulated glass unit or applied to the surface of such a unit.

The glass sheet is preferably coated with a layer to improve bonding of the resin to the glass a suitable layer is a silane or mixture of silanes in solution e.g. in water and an alcohol such as isopropyl alcohol.

To form the structure of the invention the mould is preferably positioned so that it is at an angle to the horizontal and the glass sheet clamped to the mould to form a mould cavity, there is an inlet at the lowest end of the mould where the resin can be introduce and an air outlet at the top, the casting resin and hardener is introduced into the mould at the lowest point and it fills up the mould and the displaced air goes out through the air outlet; this reduces the possibility of air bubbles being formed.

The glass sheet can be transparent or it can be coloured or decorated as required, if it is silvered a mirror can be formed. The mould can be divided into separate sections and different resins can be introduced in different sections e.g. different sections can have different colours etc.

The cast resin can be formed so that it has grooves or the like formed in it which, when the resin is cured can be painted to give the appearance of leaded lights.

The invention is illustrated in the accompanying drawings in which: -

Fig. 1 shows a schematic view of a mould and

Fig. 2 shows a side view of the mould partially filled with resin

Fig. 3 shows a side view of the mould full of resin

A substantially inelastic mould (1) is coated with a release agent and has silicone rubber strips (6) located in grooves in the mould to define an area of the mould. Transparent glass sheet (2) is placed on the silicone rubber strips and clamped in place to define a mould cavity (7) between the mould (1) and the glass sheet (2). An acrylate resin and hardener (8) is introduced into the mould at inlet (4) to fill the mould cavity (7) and the displaced air exits at outlet (5).

After about an hour at ambient temperature the resin cures to form a hard transparent resin which is stuck to the glass sheet (2) and the mould is unclamped and separated from the glass sheet. The glass sheet with a contoured surface can then be used e.g. as a window door panel etc.

Claims

1. A method of forming a decorative structure which comprises positioning a mould against a flat sheet to form a mould cavity between the sheet and the mould surface, introducing a curable resin into the mould cavity to form a resin sheet with a contoured surface, curing the resin, and releasing the mould to form a sheet having a contoured resin sheet adhered to one surface in which method mould surface is formed of a substantially inelastic material.

2. A method as claimed in claim 1 in which the mould is formed of substantially inelastic materials.

3. A method as claimed in claim 1 or 2 in which the sheet is a transparent or translucent glass sheet.

4. A method as claimed in any one of claims 1 to 3 in which there is a release agent such as gel, oil, wax or chemical release agent on the surface of the mould.

5. A method as claimed in any one of the preceding claims in which there is a groove in the mould in which there is an adjustable sealing strip and the glass sheet is positioned on the strip so that the height of the strip above the mould controls the thickness of the resin layer on the glass surface.

6. A method as claimed in any one of the preceding claims in which the mould surface is reinforced with a solid material to form a rigid structure.

7. A method as claimed in claim 3 in which the surface of the mould is patterned so that surface effects are formed on the casting.

8. A method as claimed in any one of the preceding claims in which the casting resin is a polyester resin which, when it cures, forms a hard transparent glass like surface

9. A method as claimed in claim 8 in which the resin, which is introduced into the mould cavity with a hardener so that it cures to form a hard resin.

10. A method as claimed in any one of the preceding claims in which the mould is positioned so that it is at an angle to the horizontal and the glass sheet clamped to the mould to form a mould cavity, there being an inlet at the lowest end of the mould where the resin can be introduced and an air outlet at the top, the casting resin is introduced into the mould at the lowest point and fills up the mould and the displaced air goes out through the air outlet.

11. A decorative structure made by the method of any one of the preceding claims.

Abstract

A glass sheet having a contoured or bevelled surface is formed by casting a polyacrylate resin using a substantially inelastic mould.

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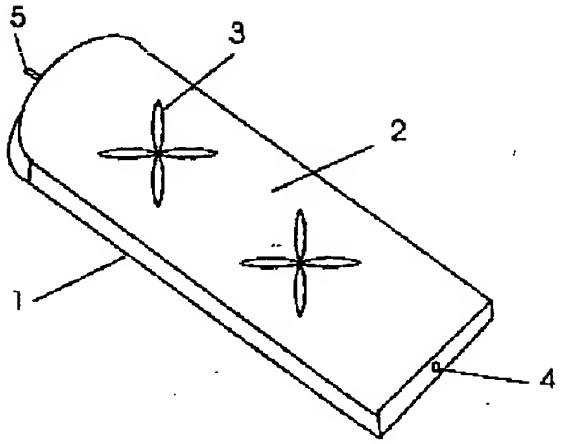

Fig. 1

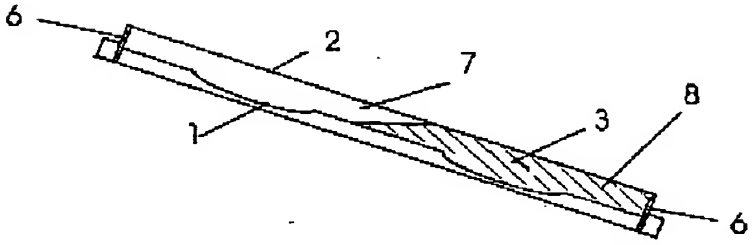

Fig. 2

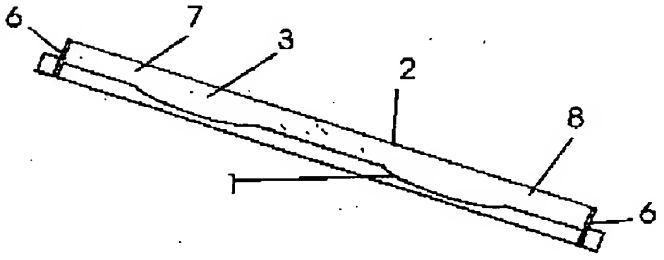

Fig. 3